

# PATENT ABSTRACTS OF JAPAN

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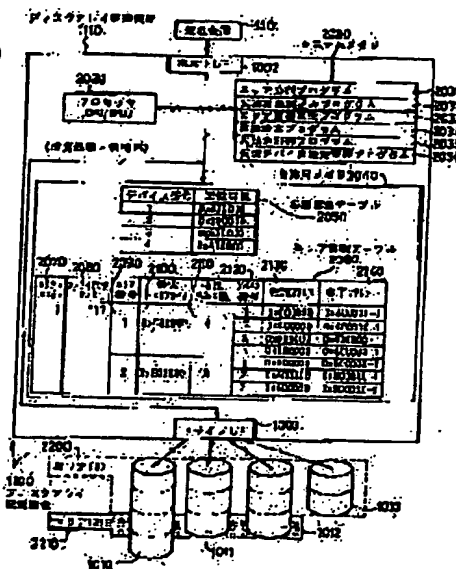
(71)Applicant : HITACHI INF TECHNOL:KK  
(72)Inventor : YOSHIDA TORU  
AOKI TAKESHI  
TATESHIMO MASASHI

## (54) ARRAY-TYPE STORAGE DEVICE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To eliminate the restriction of the storage capacity of storage devices to be mounted by providing a specified area setting means, an address calculation means and the like.

**SOLUTION:** A disk array controller 1110 and disk storage devices 1010-1013 are provided. In the device, the area setting means sets a first storage area for allocating a first address space by adjusting it to a first largest storage capacity which is the smallest in the storage capacity of the storage devices 1010-1013 and forming an array, allocates a second address space by adjusting it to a second largest storage capacity which is the smallest among remaining capacities obtained by subtracting first largest storage capacity from respective largest storage capacities in plural storage devices except for the storage device of the first largest storage capacity which is the smallest and forms the array. An address calculation means calculates the physical addresses of the storage devices 1010-1013 in accordance with the first or second storage area forming the array based on an access address from a host processor.



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(71)Applicant : HITACHI LTD

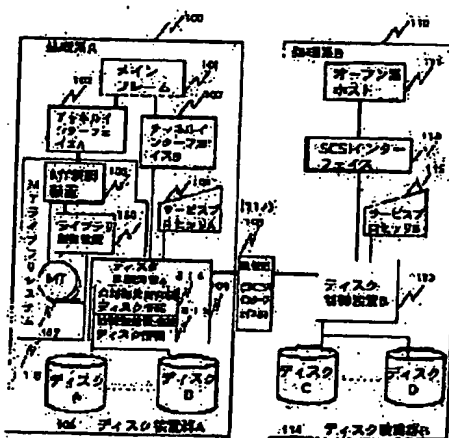
(22)Date of filing : 01.04.1997

(72)Inventor : FUKUZAWA YASUKO  
YAMAMOTO AKIRA  
NAKANO TOSHIO

**(54) COMPOSITE COMPUTER SYSTEM AND COMPOSITE I/O SYSTEM****(57)Abstract:**

**PROBLEM TO BE SOLVED:** To back up data of an I/O sub-system for opening in a backup system of main frame management which is not directly connected to this I/O sub-system.

**SOLUTION:** A B-system I/O sub-system (113 and 114) for opening and an A-system I/O sub-system (104 and 105) for main frame are connected by a communication means, and the A-system I/O sub-system is provided with tables 314 and 315 to assign a storage device address in its own sub-system to a storage device of the I/O sub-system for opening so that data in the B-system I/O sub-system can be accessed from the main frame for the purpose of backing up data of a disk connected to the B-system I/O sub-system in an MT library system 116, and a request in a variable length recording form accepted from the main frame is converted to a fixed length recording form of the B system, and a designated disk is accessed based on tables, and obtained data is sent to the main frame and is backed up in the backup system.

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(21)Application number : 2000-066061  
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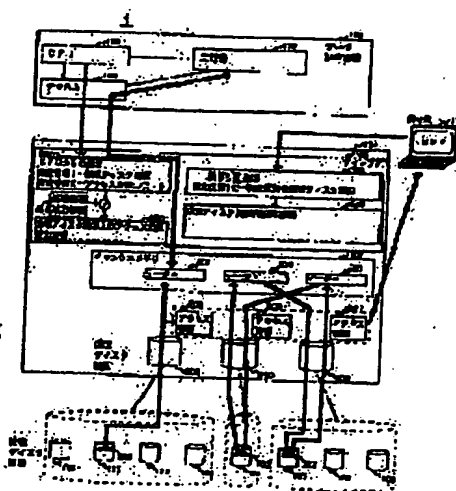
(71)Applicant : HITACHI LTD  
(72)Inventor : YAMAMOTO YASUTOMO  
YAMAMOTO AKIRA  
SATO TAKAO

## (54) STORAGE CONTROLLER

### (57)Abstract

**PROBLEM TO BE SOLVED:** To improve the access performance in sequential access, etc., by performing rearrangement to a physical storage device in units of logical storage drives and successively storing data on the physical storage device.

**SOLUTION:** A service engineer refers to access information 500 presented by an SVP 111 to examine the rearrangement of the logical disk drives 200. Consequently, when there is a logical disk 200 decided to be rearranged, a rearrangement indication 620 is sent to the storage controller 104. A director 106 receives the indication 620 and performs a logical disk rearranging process 630 between two specified logical disk drives 200. At this time, logical-physical correspondence information 300 is used to transfer data in one-process units to be rearranged from the physical disk drive 105 to a cache memory 107. Then the data 201 in the process units on the cache memory 107 are repeatedly written to the physical disk drive 105 as a rearrangement destination and the correspondence information 300 is updated after the writing is completed.



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(21)Application number : 11-242713

(71)Applicant : HITACHI LTD

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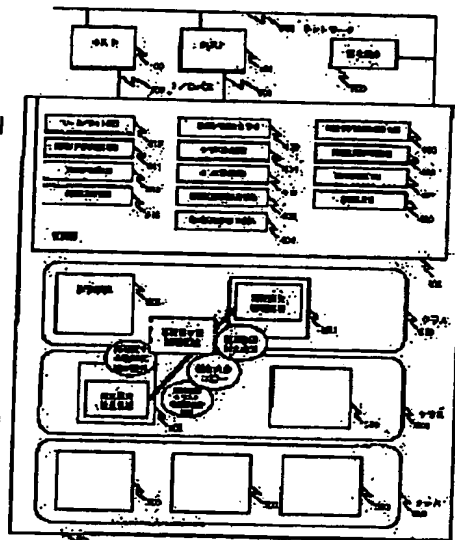
(72)Inventor : ARAKAWA TAKASHI  
MOGI KAZUHIKO  
YAMAKAMI KENJI  
ARAI HIROHARU

## (54) STORAGE SUB-SYSTEM AND ITS CONTROL METHOD

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To simplify a work for optimizing arrangement by re-arrangement by the user of a disk array system or the like by changing the correspondence of a logical storage area from a physical storage area into the second physical storage area and executing re-arrangement.

**SOLUTION:** A control part 300 automatically executes re-arrangement execution processing at the set time and date. That is, the part 300 copies contents stored in a re-arrangement source physical area in a re-arrangement destination physical area based on re-arrangement information 408. Moreover, at the point of time when the copying is completed and the whole contents of the re-arrangement source physical area are reflected in the re-arrangement destination physical area, the control part 300 changes a physical area corresponding to a logical area for executing re-arrangement in logical/physical correspondence information 400 from the re-arrangement source physical area into the re-arrangement destination physical area. Besides, the control part 300 uses the re-arrangement destination physical area on a non-usage physical area 1470, changes the re-arrangement source physical area into the non-usage one and, moreover, updates the time and date of re-arrangement execution time information 406 into the one for a next time by referring to time and date updating information on re-arrangement execution time information 406.



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(71)Applicant : HITACHI LTD

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(72)Inventor : EGUCHI KENTETSU

MOGI KAZUHIKO

ARAKAWA TAKASHI

OEDA TAKASHI

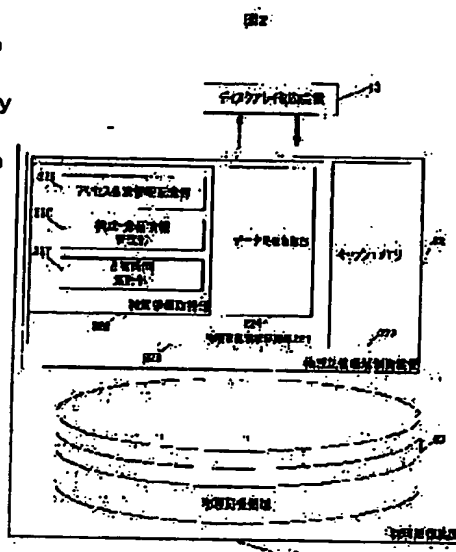
ARAI HIROHARU

### (54) STORAGE SUB-SYSTEM, AND MEMORY USED THEREFOR

#### (57)Abstract:

**PROBLEM TO BE SOLVED:** To obtain an occupied time of a logic storage area in a physical memory, and to obtain precise access occupied time information in every I/O to the physical memory.

**SOLUTION:** A physical storage area controller 22 on the individual physical memory 15 is provided with a table 225 for storing information about access requirement from a host computer, a table 227 for totalizing the occupied time as to access, a table 226 for control information for classifying constitution of a disk array, and a data processing control part 224 for obtaining constitution information and classification information of the logic storage area from a disk array controller 13, and for requesting the constitution information and the classification information of the logic storage area to the disk array controller, when necessary. The disk array controller 13 is provided with a means for transmitting the constitution information of the disk array at the present time to the physical storage area controller in response to the request from the physical storage area controller on the physical memory.



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